Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Federal-State Joint Board on	)	CC Docket No. 96-45
Universal Service	)	
	)	
Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LECs	)	

RECEIVED

JUL 2 3 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

COMMENTS OF U S WEST, INC.

U S WEST, INC.

Robert B. McKenna
Kathryn E. Ford
Steven R. Beck
Suite 700
1020 19th Street, N.W.
Washington, D.C. 20036
(303) 672-2736

Of Counsel,
Dan L. Poole

July 23, 1999

No. of Copies rec'd_____
List A B C D E

TABLE OF CONTENTS

SUMMARY

Tril-o-gy: a series of three dramas or literary works or sometimes three musical

compositions that are closely related and develop a single theme. Webster's New Collegiate

Dictionary. Congress, the original author of the Telecommunications Act "trilogy," clearly had a

theme in mind: develop and encourage competition in all sectors of the telecommunications

market through neutral, thoughtful, and balanced regulatory actions. Like a best selling novel

emasculated in a made-for-television mini-series, however, the FCC has taken an inordinate

amount of "artistic license" in its direction of the competition trilogy. Unfortunately for the FCC,

too many people read the book first!

The hard, stark reality is that the FCC's decisions, recommendations, and proposed

resolutions of various universal service issues and issues relating to the forward-looking

economic cost model and inputs would do nothing but perpetuate the status quo. Universal

access to basic telephone service at affordable rates through the use of an explicit support

mechanism is no more advanced in the FCC's recent decisions than it was when this

excruciatingly long process began over three years ago. As unacceptable as the delay has been

even reaching this point, the Commission's Synthesis Model is so completely beyond salvage

and the inputs the Commission proposes to use in that model are so utterly afield of reality, that

U S WEST has no choice but to withdraw all support for use of this forward-looking cost model.

Since it so blatantly understates cost, it cannot implement the intent of Congress for a sufficient

explicit universal service fund.

The FCC's Synthesis Model is the epitome of a black box. It even violates the FCC's

well-articulated criteria for a forward-looking cost model as set forth in its May 1997 Universal

Service decision. It is indecipherable in many critical respects, even by industry experts who

work with and build cost models for a living. The pieces of the model that can be analyzed are full of errors, inconsistencies, and faulty algorithms. To compound the problem, the majority of proposed or recommended inputs, especially those that have the largest impact on the bottom line costs developed by the model, bear no relationship to reality.

Rejecting the model may sound like throwing three plus years of work down the drain. In reality, however, the most serious damage was done last fall, when the Commission issued its *Platform Order* adopting the Synthesis Model in place of both the HAI and BCPM models, which industry representatives had been consistently updating and refining according to FCC instructions and requirements. Rejecting the model at this point may put the Commission in a conundrum: should it listen to the complaints about delay and go forward with a bad model just to say it did something or should it listen to complaints about its model and develop alternative implementation plans, knowing it will face complaints about further delay. The fact that there may be a short further delay does not relieve the FCC from its legal obligations to implement the Act. Recognizing that the law requires the FCC to make implicit support explicit and sufficient— something U S WEST wholeheartedly supports – this process the FCC has engaged in hasn't moved the ball in that direction. Adopting this model and the proposed inputs and moving forward with implementation in January, 2000, just for the sake of doing something, will not satisfy the FCC's legal obligations.

The results of the FCC's model can not come close to identifying the true cost of serving high cost customers. Consequently, the fund size will be artificially low, requiring either telephone rate increases – the economically sound approach – or unlawful continuation of implicit subsidies. This in turn will prevent NRLECs from removing implicit subsidies from other rates and/or will make it difficult, if not impossible, for NRLECs to continue to serve high

cost customers at anything approaching current rates and will prevent them from serving some rural customers at all.

In the comments that follow, U S WEST will address some of the bigger problems with the model and the inputs the Commission proposes adopting. The length of U S WEST's comments are telling: in sixty plus pages, U S WEST believes it has only observed the tip of the iceberg when it comes to identifying problems in this model. Many of the internal algorithms and calculations simply cannot be analyzed. What is available for scrutiny, however, is more than enough to lead to the conclusion that this model is beyond repair. Nevertheless, U S WEST has recommended changes that should be made to the model. There should be no mistake, however, that U S WEST does not recommend trying to "fix" this model.

What U S WEST does recommend, is that the Commission decide if it is really trying to provide sufficient explicit support to truly high cost areas in this country. If so, the FCC should abandon its flawed approach and refocus on the goal of simply directing support to high cost areas. If not, the State Commissions will have no alternative but to move local rates decisively toward cost.

If the FCC rejects the model, which U S WEST believes they should, U S WEST suggests the adoption of a simple three step process, to target high cost support. The FCC must first identify the areas across the nation that have low-population density. For example, the FCC could identify areas that have fewer than 200 persons per square mile. These areas can be identified using geographic information systems and commercially available data. The second step is to ask eligible telecommunications carriers (ETC) to provide geocoded service address data (latitude and longitude) for each customer they serve in these areas. If an ETC wishes to receive support, it must identify its customer locations in the low-density areas. If a company

does not wish to receive support, it need not provide the customer location data. The final step is to use a simplified cost equation to develop the cost. The support level needs to be a reasonable estimate, not an exact engineering replica of the network cost. Ultimately, the fund size is a political decision (this is discussed in U S WEST's Comments concerning the implementation FNPRM).

If the Commission cannot, for whatever reason, eliminate implicit subsidies through sufficient explicit high cost funding, it must continue a significant amount of implicit subsidies in interstate access.

In the Matter of	)	
	)	
Federal-State Joint Board on	)	CC Docket No. 96-45
Universal Service	)	
	)	
Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LECs	)	

COMMENTS OF U S WEST, INC.

U S WEST, Inc. ("U S WEST") hereby submits these comments in response to the

Commission's Further Notice of Proposed Rulemaking.[1] U S WEST respectfully suggests that

the Commission seriously reconsider the ongoing validity of its model platform[2] as well as the

proposed inputs in the instant FNPRM and take immediate steps to implement an appropriate

high cost support mechanism based on legitimately estimated, forward-looking costs of

providing supported services.

I.   OVERALL FAULTS WITH SYNTHESIS MODEL

A.   Introduction

Over three years have passed since Congress called for Universal Service Reform in the

Telecommunications Act of 1996 ("1996 Act" or "the Act"). As the Supreme Court so

eloquently recognized, the Act is not a "model of clarity" and "is in many important respects a

---

[1] *Federal-State Joint Board on Universal Service,* CC Docket Nos. 96-45, 97-160, Further
Notice of Proposed Rulemaking, FCC 99-120 (rel. May 28, 1999) (hereinafter "Inputs
FNPRM").

[2] *Federal-State Joint Board on Universal Service,* Fifth Report and Order, CC Docket Nos. 96-
45, 97-160, 13 FCC Rcd 21323 (1998) ("Platform Order").

model of ambiguity or indeed even self-contradiction."[3] Nevertheless, it couldn't be clearer that

the pieces of the Act, however obscure individually, were intended to fit together. Then FCC

Chairman Reed Hundt recognized early on that the policies of the Act were part of a "trilogy."[4]

Some have likened the trilogy, *i.e.*, interconnection, universal service, and access reform, to a

"three-legged stool." Universal Service reform, called for in § 254 of the Act, is a necessary and

indispensable third leg of the stool. As aptly noted by Alfred E. Kahn, however, "[t]he three legs

have to be of the same length."[5]

Following on the heels of its Interconnection and Access Reform orders, on May 27,

1999, the Commission adopted its Seventh Report and Order ("R&O") and Thirteenth Order on

Reconsideration in CC Docket No. 96-45 and Fourth Report and Order in CC Docket No. 96-262

and Further Notice of Proposed Rulemaking ("FNPRM"). The purpose of these Orders and the

Rulemaking was to continue the implementation of the "explicit" universal support mechanisms

for non-rural Local Exchange Carriers ("NRLECs") and to seek additional input on items related

to the NRLEC explicit mechanism. In addition, the Commission issued the instant FNPRM in

CC Docket Nos. 96-45 and 97-160, relating to the forward-looking economic cost model. This

Inputs FNPRM, billed as the second stage of a two stage proceeding, purportedly will culminate

in the use of the forward-looking economic cost model to determine high cost support for non-

---

[3] *AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. 721, 860 (1999).

[4] Speech of Reed Hundt, Joint Meeting of the Great Lakes Conference of Public Utilities
Commissioners and Mid-Atlantic Conference of Regulatory Utility Commissioners, Cleveland,
Ohio, July 8, 1996. ("At the FCC, Congress has given us, in effect, a contract to write a
trilogy."); Speech of Reed Hundt to the Communications Committee, National Association of
Regulatory Utility Commissioners, Los Angeles, California, July 23, 1996. ("As I see it, in the
next six months we've got a trilogy of rules to write at the FCC, in the Joint Board, and in the
same time, each state has its own, local even more extensive version of these same rules to write
in rulemakings and in arbitrations. . . . The three volumes of the trilogy are called
Interconnection, Universal Service and Access Reform.")

[5] Alfred E. Kahn, *Letting Go: Deregulating the Process of Deregulation*, 119 (1998).

rural carriers beginning January 1, 2000. This is volume three – the climax of the trilogy –

where all things are to fall into place, come together, and finally make sense.

Sadly, volume three of the trilogy, the FCC's Universal Service Order and FNPRM, in

combination with the Commission's *Platform Order*, its various orders on reconsideration, and

its FNPRM's mentioned above, have come together to once again make Alfred Kahn a seer.

Troubled by the FCC's intended delay in implementing a support mechanism to January 1,

1999,[6] Professor Kahn nevertheless generously recognized that such a delay should not

necessarily reflect adversely on the Commission:

> The tasks imposed upon [the FCC] by the Telecommunications Act were
> gargantuan. In particular, the task of developing, under intense political
> pressure and public scrutiny, a rational, comprehensive system for
> defining, maintaining and financing all of the subsidies that public policy
> continues to insist on providing for basic residential rates generally and
> insists now on extending to schools, libraries and health facilities—all
> henceforward to be financed "rationally" instead of by the present crazy-
> quilt of internal subsidies—was in essential respects oxymoronic.[7]

As if setting aside the delay and peering into the future, Professor Kahn noted prophetically:

> [I]t is unlikely to be any easier politically to impose an explicit tax on all
> bills for telecommunications services than it would be to do the
> economically right thing in the first place: simply raise the basic
> residential and other subsidized charges and reduce—or permit
> competition to reduce—all the others that currently subsidize them.

and,
> [In the USF proceedings] it may safely be predicted, the political pressures
> that continue to suppress prices of the subsidized services will continue to

---

[6] In its *Report and Order In the Matter of Federal-State Joint Board on Universal Service,* CC
Docket No. 96-45, adopted May 7, 1997, (hereinafter, *Universal Service Order*), the
Commission announced its intention to establish a universal service support mechanism to take
effect on January 1, 1999. The Commission has since delayed that implementation until at least
January 1, 2000.

[7] Kahn, *Letting Go: Deregulating the Process of Deregulation,* 121. One wonders whether
Professor Kahn would or should be as forgiving of the FCC for the further delay to January,
2000.

discourage the levy of "competitively neutral" and minimally inefficient taxes sufficient to fill the gap. If we now recognize that added to those historical political pressures is the pressure on commissions quickly to show some positive benefits to consumers from the new Act, we must recognize the danger—indeed, the likelihood—that they will be more forceful in reducing the one than in increasing the other.

and finally,

> [T]here are troubling signs that when and if a reform system for subsidizing universality of subscription is ever provided, it will have been subjected to all sorts of pressures to whittle it away—both quantitatively (that is, in fixing its requisite size) and in terms of the competitive neutrality and efficient pricing that it was intended to ensure.[8]

After an agonizingly slow three years of comment, debate, ex partes, model submissions, model revisions, further NPRMs, public notices, workshops, staff analyses, etc., the FCC's model fails to meet the FCC's own criteria for forward-looking cost models, uses critical inputs which bear no relationship to reality and find no justification in the FCC's decisions, and ultimately results in costs which can be deemed nothing other than predetermined and predictably far short of sufficient to cover the mandated removal of subsidies. Through its model selection and proposed inputs, the FCC has, as predicted by Alfred Kahn, "whittled away" at the proverbial third leg of an already shaky stool. Unfortunately, unlike a stool with minor unevenness, the FCC's cost model and input decisions can no longer be propped up for continued use.

U S WEST will comment on the particular inputs and other issues raised by the FCC in this Inputs FNPRM. However, the record over the past three years with respect to model and input selection lead to the inescapable conclusion that, notwithstanding claims to the contrary, the FCC has had a predetermined fund size in mind all along, and is tinkering with the model only to reach its predetermined result.

---

[8] *Id. at 120-22.*

Under the guise of getting to the right model and the right cost determinations, the Commission has strung along the cost model proponents, accepting models, recommending and even demanding major and expensive changes to those models, seeking comments, holding workshops, and collecting actual factual information regarding costs and inputs. For two and a half years the Commission staff scrutinized various versions of the BCPM and HAI models. In fact, the Commission requested that state commissions choose between the two models by a certain date. Based on these directions, numerous state proceedings were held, calling on the resources not only of the parties submitting the models, but also of the state commissions and their staffs, many of whom hired expert consultants at great expense to review the models.[9] Further, many states made interim decisions regarding cost models and high cost funds, but have postponed making final decisions regarding the models and funds because of the delay at the FCC level. Notwithstanding the length of time and amount of resources spent on modifying and submitting various versions of both the BCPM and HAI, the Commission issued its *Platform Order* in October, 1998, adopting as its platform its own "Synthesis Model." Prior to October, 1998, this model was not readily shared with other interested parties and was not subjected to the same scrutiny as the various versions of BCPM and HAI. Since October, 1998, the Synthesis Model (SM) has undergone a multitude of changes and modifications, some shared and explained, some not, and it continues to be changed and "updated" to this date. In fact, even after the Commission issued the Inputs FNPRM seeking the purported last round of comments on inputs to the model, the Commission released yet another version of the model and, two weeks later, released model results. The two and a half year scrutiny the Commission gave to

---

[9] In U S WEST's region alone, ten of fourteen states held some type of proceeding on cost models for universal service purposes and at least five of those state commissions or their staffs hired expert consultants.

BCPM and HAI has, for its own model, been reduced to 30 days.[10]   Moreover, there is

apparently no limit to the number and significance of changes that are yet to be made to the

model. The Commission, in its Order, gave its staff the unilateral right to change the model

going forward.[11]

Since the October, 1998, *Platform Order*, U S WEST has continued to work with the

Commission staff on this model in an effort to correct as many of the flaws in the model as

possible. Disappointingly, it appears from this most recent Order and FNPRM, that the model

itself, as well as the recommended inputs, continue to be flawed in a manner that suggests a

deliberate disinterest in repairing them. Given sufficient time, U S WEST would comment on

each and every flaw in the model, as well as each and every flaw in the proposed inputs, and

make recommended changes. Recognizing the time limitations as well as the black box nature of

the model, however, the focus of the remainder of these comments will be on the major model

and input flaws that were easily identifiable, as well as the evidence suggesting the

Commission's results -oriented approach. But it must be recognized that the model selected for

Universal Service calculations is in all respects identical to a Commission rule, and is subject to

all of the legal constraints which protect the parties to a rulemaking. A model such as is

currently proposed cannot be lawfully adopted.

B.   Non-Compliance with FCC's Own Rules

Ironically, one of the major problems with the FCC's SM is that it fails to meet the

forward-looking cost model criteria established in the FCC's own May 7, 1997 <u>Report and Order</u>

---

[10] The additional three week extension granted recently added no appreciable time to review this model in comparision to the 2 ½ year review of the HAI and BCPM models.

[11] *Inputs FNPRM,* para. 19. (". . . technical improvements to the cost model will continue, both before implementation of the model for non-rural carriers and on an ongoing basis, as necessary.

in CC Docket No. 96-45 (the *Universal Service Order*). At paragraph 250 of the *Universal Service Order*, the Commission stated, "...we agree that all methodologies used to calculate the forward-looking economic cost of providing universal service in rural, insular, and high cost areas must meet the following criteria:"

> FCC Criteria #1
> *The technology assumed in the cost study or model must be the least-cost, most-efficient, and reasonable technology for providing the supported services that is currently being deployed. A model, however, must include the ILECs' wire centers as the center of the loop network and the outside plant should terminate at ILECs' current wire centers. The loop design incorporated into a forward-looking economic cost study or model should not impede the provision of advanced services. For example, loading coils should not be used because they impede the provision of advanced services. We note that the use of loading coils is inconsistent with the Rural Utilities Services guidelines for network deployment by its borrowers. Wire center line counts should equal <u>actual ILEC wire center line counts</u>, and the study's or model's average loop length should reflect the incumbent carrier's actual average loop length.*

(Emphasis added).

The SM does not utilize actual ILEC wire center line counts. In fact, the line counts table includes many locations that contain data with fractional line counts, such as 0.8 lines. Further, the output reports also demonstrate that the line count data is inaccurate. Density output reports show many density zones with <u>negative</u> line counts for secondary residence lines. The SM contains algorithms that determine primary and secondary residential line counts based on PNR and ARMIS data. These algorithms are flawed. Clearly, investment algorithms, which utilize line count data, cannot produce accurate results if they are utilizing negative line counts. Use of negative line counts biases costs downward.

The Commission therefore delegated to the Bureau the authority to make changes or direct that changes be made to the model platform as necessary and appropriate. . . .").

Another area of concern is the development of special access lines used in the model. The special access line count methodology is inconsistent throughout the model. The methodology for determining special access lines varies depending on the module (Visual Basic Cluster Module, Turbo Pascal Cluster Module, and Turbo Pascal Loop Investment Module) of the SM, even though these counts should represent the same defined line count in each module of the SM. Additionally, the special access lines are not physical lines at all, but channel equivalents that are not relevant to the economies of scale that may be gained in distribution plant. **(See discussion of special access lines at Section II.D.).** These facts demonstrate that the line data is highly inaccurate, leads to inaccurate cost estimates (biased downward) in all geographic areas and does not meet the FCC's own criteria one.

> FCC Criteria #3
> *Only long-run forward-looking economic cost may be included. The long-run period used must be a period long enough that all costs may be treated as variable and avoidable. The costs must not be the embedded cost of the facilities, functions, or elements. The study or model, however, must be based upon an examination of the current cost of purchasing facilities and equipment, such as switches and digital loop carriers (rather than list prices).*

(Emphasis added).

The SM material cost inputs do not recognize the current cost of purchasing facilities and equipment in many instances. The most outstanding example of this is the selected input values for plant structure. The Commission chose to use a dubious extrapolation of statistical regression results (see analysis by LECG (appended hereto) as **Attachment A**) rather than using structure cost data submitted into the record by multiple parties such as GTE and Sprint. The flawed use of the statistical technique results in the understatement of costs.

FCC Criteria #6
The cost study or model must estimate the cost of providing service for all businesses and households within a geographic region. This includes the provision of multi-line business services, special access, private lines, and multiple residential lines. Such inclusion of multi-line business services and multiple residential lines will permit the cost study or model to reflect the economies of scale associated with the provision of these services.

(Emphasis added).

The SM does not appropriately provision multi-line residential lines nor multi-line businesses. First, it is clear that the multi-line residential lines are not properly included by examining the density zone reports that display negative secondary residence lines. It is unclear as to how the model responds to negative line counts. One thing is clear, however; it cannot yield accurate cost results when its line count algorithms produce negative line counts. Second, multi-line businesses are predominantly located in multi-tenant buildings. The SM does not even attempt to correctly develop costs for multi-tenant buildings. The SM treats each tenant as an individual lot and serves this lot as it would serve a single family residence. This understates the cost of serving multi-line businesses everywhere.

FCC Criteria #7
A reasonable allocation of joint and common costs must be assigned to the cost of supported services. This allocation will ensure that the forward-looking economic cost does not include an unreasonable share of the joint and common costs for non-supported services.

(Emphasis added).

The SM inputs do not include a reasonable allocation of joint and common costs associated with basic local service. The Commission has misapplied productivity factors to network operations and corporate operations, and has used a biased study of marketing expenses which double counts reductions to the marketing account. Additionally, the Commission has

9

disregarded, without comment, current actual data provided by parties, such as U S WEST and Sprint.

> FCC Criteria #8
> *The cost study or model and all <u>underlying data, formulae, computations, and software</u> associated with the model <u>must be available to all interested parties</u> for review and comment. All underlying data should be verifiable, engineering assumptions reasonable, and outputs plausible.*

(Emphasis added).

The SM does not meet FCC Criteria #8 for four major reasons. First, the model is a virtual black box. The CLUSTINTF and FEEDDIST modules of the SM are written in Turbo Pascal, a language no longer supported by its manufacturer, Borland. Turbo Pascal is an outdated and rarely used programming language, making review difficult. Because Turbo Pascal is an outdated language, modern testing and debugging tools are not available, making step by step review of algorithms impossible. The SM code utilizes all available Turbo Pascal resources, making it impossible to insert debugging and testing code. For practical purposes, these modules are closed "black boxes." Besides the code itself, the file formats used to transfer data from module to module in the SM are also a hindrance to reviewing and verifying the model. The use of binary file formats stymies any attempt to understand the SM's logic by examination of intermediate results.

If the FCC rewrites the model in Visual Basic, this problem will likely be resolved. To use an outdated, virtually dead, language ignores the fact that the other major cost models (BCPM and HAI) all use Microsoft Visual Basic based programming technology. Indeed, portions of the SM are written in Visual Basic. Unlike Turbo Pascal, Visual Basic offers interactive debugging and is improved and updated regularly. The community of interested

10

parties is familiar with Visual Basic, unlike Turbo Pascal, and is well suited to review and verify such code.

The second reason that the SM does not meet Criteria #8 is the lack of documentation. The FCC releases a new SM version approximately every two weeks. This pace of updates places a heavy burden on parties committed to reviewing the model as it develops. The FCC can ease this burden by more rigorously documenting each new version's changes. Currently the FCC provides a rather incomplete archive of major changes through the document "history.doc." While this is marginally helpful, reviewers still must identify any sections of code that have been modified. Parties have no way to know what errors the code change is correcting, or if indeed the new code actually corrects the "problem," since the problem itself is never identified.

The third reason that the SM does not meet Criteria #8 is that certain technical aspects of the SM's design compromise interested parties' ability to review, test, and verify the model. The extremely slow execution of the program is an impediment to effective analysis. Because current versions cannot be validated using interactive debugging, the only way to test the model is to perform sensitivity analyses and compare the outputs. The SM is so slow, however, that the process of running scenarios must now be shared across multiple computers. The slowness of the SM is more than an inconvenience, it effectively limits the model's openness to testing. In fact, in a Public Notice dated June 15, 1999, where the FCC provides preliminary output data for public analysis in the instant proceeding and related FNPRM, the FCC itself disabled their recommended "optimization of distribution plant" algorithms because of the extremely long run time involved. Apparently, even with this recommended algorithm "turned off", the FCC was unable to provide this data in a timely fashion, releasing it 18 days after the related order,

leaving parties only 17 days to analyze the data and draw conclusions.[12] U S WEST has

examined and compared the outputs for a number of states using and not using the "optimization

of distribution" and the two techniques generate considerably different results by density group.

This has a great impact on the size of a universal service fund. At cluster level targeting the

optimization of distribution plant reduces the fund size by approximately $450M. Thus, the SM

itself is limiting the interested parties' ability to analyze the relevant data for universal service

fund determinations.

The fourth reason that the SM does not meet Criteria #8 is that the results are not

reasonable at either a macro level or a micro level. As explained in Section I.D., the inputs of

SM have been manipulated to generate predetermined results that artificially maintain a

universal service fund size approximately the same as today. Additionally, at the micro level,

the model generates unreasonable investments that cannot be linked to the inputs used in

calculating investments. For example, examining clusters in the Douglas wire center

(DGLSWYMA) in Wyoming and the Curtis Park wire center (DNVRCOCP) in Colorado

reveals that the NID counts do not relate to the number of customer locations nor to the number

of lines served at the location. This is a result of poorly specified algorithms within the model.

In summary, SM fails Criteria #8 miserably. No state commission would ever adopt a

model as closed and inaccessible as the SM if it were proffered by an ILEC for all the reasons

stated above. The FCC should take an unbiased look at the SM and reject it for the same

reasons.

FCC Criteria #9
The cost study or model must include the capability to examine and modify
the critical assumptions and engineering principles. These assumptions

---

[12] This date was later extended another 21 days. However, given the "black box" nature of the
model, this extension still provides too little time for a comprehensive analysis.

and principles include, but are not limited to, the cost of capital,
depreciation rates, fill factors, input costs, overhead adjustments, retail
costs, structure sharing percentages, fiber –copper cross-over points, and
terrain factors.

(Emphasis added).

The SM can be modified to address some of the critical assumptions enunciated in

criteria #9. However, it fails to adequately recognize terrain factors within the model for two

reasons. First, the terrain database does not utilize the geographic clusters that SM develops.

The terrain indicators are actually developed for a totally different geographic area (average

terrain conditions in a Census Block Group, which in rural areas can be greater than 100 sq.

miles) and may bear no resemblance to the terrain in a cluster (maximum size of approximately

10 sq. miles). Secondly, the model does not consider geographic features such as lakes, rivers

and mountains, routing plant through obstacles without recognizing cost or distance penalties.

<u>FCC Criteria #10</u>
The cost study or model must deaverage support calculations to the wire
center serving area level at least, and if feasible, to even smaller areas
such as a Census Block Group, Census Block, or grid cell. We agree with
the Joint Board's recommendation that support areas should be smaller
than the carrier's service area in order to target efficiently universal
service support. Although we agree with the majority of the commenters
that smaller support areas better target support, we are concerned that it
becomes progressively more difficult to determine accurately where
customers are located as the support areas grow smaller. As SBC notes,
carriers currently keep records of the number of lines served at each wire
center, but do not know which lines are associated with a particular CBG,
CB, or grid cell. Carriers, however, would be required to provide
verification of customer location when they request support funds from the
administrator.

(Emphasis added).

The SM can calculate support at the wire center, but is currently incapable of calculating

support at the cluster level. Currently, the SM does not have the capability of generating reports

that display investments and costs by the individual clusters of customer locations that are used to develop loop investments and costs. However, even if the SM could generate these reports, the cluster-specific loop investment and cost data would not be accurate. In order to generate accurate cluster cost data, the algorithms that calculate the feeder portion of the loop cost need to be rewritten to recognize unique feeder cost by cluster. Currently, the feeder plant costs are calculated on an average per-line basis for the entire wire center. Ultimately, the SM does not attempt to identify the high cost areas within a wire center and provide accurate costs at that level, which is the stated preference of Criteria 10.

C.   Programming and Algorithm Errors

1.   Flawed Clustering Algorithms

There are significant problems with the way the SM clusters customer data. The clusters produced by the model are supposed to meet the engineering constraints associated with a digital loop carrier system and serving area interface. In the SM's case, these constraints are that the copper portion of a loop should be no longer than 17,000 feet, and there should not be more than 1,800 lines in a cluster. In the current version of the SM these constraints are exceeded in many instances. Looking at the 'clu' file associated with the wire center DNVRCOCP will reveal at least 3 clusters that exceed the engineering constraints concerning the number of lines. The largest cluster has approximately 7,900 lines and the other clusters have in excess of 3,000 lines.

As might be expected, having clusters that are beyond engineering constraints distorts the loop costs. If an oversized cluster is brought within bounds, it would have a ripple effect on all other clusters. In the case of the 7,900 line cluster, there would probably be at least 4 clusters generated if the problem was fixed. This would impact the size and location of the remaining clusters within the wire center and result in additional serving area interface costs.

These oversized clusters are not confined to the DNVRCOCP wire center. Throughout the state of Colorado there are over 100 clusters that exceed the stated engineering constraints of the SM. **Attachment B** (appended hereto), **Description of the SM Clustering Methodology,** details the clustering process for one wire center. **Attachment C** (appended hereto) is an accompanying set of maps of the Denver Curtis Park wire center as it goes through the clustering process. These attachments highlight the errors in the SM clustering algorithms.

2. Output Reporting Problems

U S WEST is concerned about apparant discrepancies between the two output formats of the SM - Wire Center and Density Zone. The Density Zone format provides a built in study area average cost of both the loop and total monthly costs, but the wire center format does not. If one creates a simple weighted average sum of these two categories in the wire center output, it yields very different results. The loop monthly cost for the wire center output is as much as $0.56 less than the same study area average for the density zone output. The total monthly cost for the wire center output is as much as $4.25 less per month than the same study area average for the density zone output. While it is possible that the differences are due to improper averaging of the wire center output, there is no documentation to address the matter. U S WEST recommends that the FCC investigate its model output formats to determine if, indeed discrepancies exist. If none exist, the FCC should document how to reconcile the two output formats. If there are discrepancies, the FCC should make appropriate fixes or, at a minimum, specify which output format is to be relied upon for regulatory purposes and disable the other format.

3. Serving Area Interface (SAI) Costs

The costs of the SAI continue to be understated in the SM. Currently the costs are determined by the number of cable pairs entering and leaving the interface. However, the actual

cable sizes for the cables entering and leaving the SAI should be used to determine the size of SAI.

4.   Network Interface Device (NID) Costs

The SM model currently provides a single NID for every lot. There is no recognition for the number of lines that are actually present in a given lot. Typically a NID can serve 3 lines. If this number of lines is exceeded, then multiple NIDs must be placed or an indoor SAI should be placed.

5.   Drop Costs

Drop costs are also not correctly calculated for many of the same reasons mentioned for the NID above in the SM. When the number of lines per lot is greater than 2 then multiple drops or a cable need to be placed. There are currently no provisions in the model to handle this situation. The model uses a uniform cost of $.56 per foot, (which is clearly understated) no matter what the drop size. This seriously underestimates the cost to connect a customer location to a drop terminal.

6.   Drop Terminal Costs

The calculation of drop terminal costs is also incorrect. In the SM, a single drop terminal serves four lots. Again, when the number of lines to be served is greater than 25, the SM adds no additional terminals. For example, if there were a 100 lines in the lots to be served by a drop terminal, the SM still places just a single 25 pair terminal. What should happen is that the number of lines for all the lots served by the drop terminal should be summed to determine if a different serving arrangement or multiple terminals should be used.

D.   Results-Oriented Approach

All of the foregoing errors generally bias the model results downward. As noted, in addition to the model's failure to comply with the Commission's own criteria for cost models as

well as its numerous programming and algorithm errors, many of the Commission's decisions

regarding the model's operation, as well as the proposed inputs, can be read as more an attempt

to reach a predetermined result rather than to get to the correct calculations. These decisions,

combined with the Commission's recent comments directing that the fund not be substantially

larger than the current existing fund, directly support this conclusion.[13]

1. The Commission's decision to ignore unrebutted factual evidence presented by various parties.

U S WEST provided a number of studies demonstrating the correct values for

engineering assumptions with regard to switching and the development of expenses and expense

factor values for use in the SM.[14] For the two switching inputs, the Commission chose the HAI

values, which have no factual basis or support. No explanation was provided in the Inputs

FNPRM as to why the HAI defaults were more justifiable than U S WEST actual data.

U S WEST also provided detailed examples of how to properly apply a current cost to book cost

ratio in the development of plant specific expenses. As part of its presentation, U S WEST

provided expense methods and current expense factors related to basic local service. As will be

discussed further below, neither of these studies were rebutted or even acknowledged in the

Commissions choice of expense factors in the Inputs FNPRM. Other ILECs, such as Sprint,

---

[13] *Federal-State Joint Board on Universal Service*, Seventh Report and Order and Thirteenth Order on Reconsideration in CC Docket No. 96-45, Fourth Report and Order in CC Docket No. 96-262 and Further Notice of Proposed Rulemaking, FCC 99-119 (rel. May 28, 1999) at p. 8 (". . . at this time we agree with the Joint Board that we should not increase the amount of explicit federal support significantly from current explicit levels.").

[14] Two studies were discussed and provided in an *Ex Parte* contact with the BCPM Sponsors on January 8, 1999. These two studies provided factual U S WEST information that inputs for Switch Port Administrative Fill should not exceed 80% and that Maximum Trunk Occupancy, CCS should not exceed 18.32. In *Ex Parte* comments on January 15, 1999 and February 1, 1999, U S WEST provided an analysis of the flawed CC to BC ratio which the Commission proposed to use in the development of expenses, as well as the correct methodology for developing

GTE, and Bell South, who submitted actual data, were apparently ignored in a similar manner. In the Inputs FNPRM, the Commission relied almost exclusively on the flawed use of regression techniques. The Commission also did not attempt to use the vast store of factual data that was submitted by the ILECs to develop input values or validate the outputs of their regression analyses. Rather, the factual data were ignored in the Commission's discussion and justification of its input values.

2. The Commission's decisions regarding module activation

Indicative of predetermination of model results is the FCC's use of the lessor of two cable plant forecasting techniques. As stated in ¶ 57 of the Inputs FNPRM:

> The algorithm functions by first calculating distribution routing by using an engineering "rule of thumb" and then comparing the costs with the spanning tree results, choosing the routing that minimizes annual costs.

In summary, for each area, the model uses two methods for estimating the amount of plant required to serve an area and then selects the one with the lowest costs. One method requires using an engineering "rule of thumb" and the second a mathematical calculation of the minimum plant required to connect all the houses to the system.[15]

The FCC Staff has made the determination that these approaches are two separate and reasonable means of designing plant and since the objective of the model is to design the least cost network, the lower of the two should be selected. However, the FCC Staff's method is

---

expense factors. U S WEST included specific expense factors consistent with universal service definitions based on actual current U S WEST costs.

[15] A "rule of thumb" is basically a method of procedure based upon experience and common sense. It is a general principle regarded as roughly correct but not intended to be scientifically accurate. The origin of the "rule of thumb" dates back to times when beating your wife was acceptable. The "rule of thumb" was that if the stick a man used to beat his wife was smaller in diameter than his thumb, it was an acceptable practice. If it was larger in diameter than his thumb, it was assault.